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**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF TEXAS
DALLAS DIVISION**

**VICKI TIMPA, INDIVIDUALLY, AND
AS REPRESENTATIVE OF THE
ESTATE OF ANTHONY TIMPA,
AND CHERYLL TIMPA,
INDIVIDUALLY AS NEXT FRIEND
OF K. T., A MINOR CHILD,**

Plaintiffs,

vs.

**DUSTIN DILLARD,
DANNY VASQUEZ,
RAYMOND DOMINGUEZ,
DOMINGO RIVERA,
KEVIN MANSELL, GLENN JOHNSON,
AND CRIMINAL INVESTIGATIVE
UNIT, LLC,**

Defendants.

3:16-cv-03089-N

PLAINTIFFS' MOTION TO STRIKE TESTIMONY OF MARK KROLL

Pursuant to Rules 104, 702, and 703 of the Federal Rules of Evidence and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), Plaintiffs respectfully move to exclude the opinions of Mark Kroll, Ph.D.

SUMMARY OF ARGUMENT

Dr. Kroll relies on two unscientific notions for his opinion that restraint did not kill Tony Timpa. The first is two examples of “judicial pressing,” the practice of placing weights on subjects, who unlike Timpa, were on their back. The second is a biomechanical model based on *crush asphyxia* not *compression* (or *positional/mechanical*) *asphyxia* and which employs a definition of “flail chest” that is not accepted by the medical community. *Daubert* and FRE 702 require excluding his opinions, which are neither reliable nor relevant.

DR. KROLL'S QUALIFICATIONS

Dr. Kroll is not a medical doctor and certainly not a pulmonologist, cardiologist, pathologist, or physiologist. **Exhibit “A,” *Curriculum Vitae of Mark Kroll***. He is a “biomedical scientist” who studies the “body as a physics problem.” **Exhibit “B,” *Deposition of Mark Kroll***, at 5:1-7. He states his work has “almost nothing in common” with the practice of medicine. *Id.*, at 5:9-10. Bioscientists, he says, “never touch the patients.” *Id.*, at 5:19-20. His expertise comes from his work on TASER where he serves on its board. Ex. “A.” His work for the product maker, whose principal customers is law enforcement, spurred his interest in “ARDs (arrest-related death), prone restraint, and biomechanics.” **Exhibit “C,” *Expert Report of Mark Kroll***, at 5. His opinions concerning “prone restraint” came about when he became were “heavily involved with handheld electrical weapons in 2003.” *Id.*, at 4.

DR. KROLL'S REPORT AND TESTIMONY

“Compression (aka mechanical) asphyxia,” Dr. Kroll states in his report at the outset, “is a real phenomenon and it has resulted in many deaths.” *Rept.*, at 6. In his deposition, he further affirmed that restraint asphyxia “does happen in hospitals.” *Depo.*, 39:11-12. He also recognizes that such individuals trapped upside down in vehicles have been so asphyxiated. *Id.*, at 120:12-121:22. In such instances, though, Dr. Kroll states he was unable to explain the “mechanism” of death, conceding he had not studied it in detail. *Depo.*, at 120:12-25. Indeed, with the vehicular asphyxia examples, he was uncertain if death was caused by inadequate “breathing” or “blood flow.” *Depo.*, at 123:10-21. Despite these other forms of compression asphyxia, Dr. Kroll asserts compression/restraint/mechanical asphyxia gets misapplied to instances involving “arrest-related and custodial deaths.” *Rept.*, at 6. Indeed, he calls it a “myth.” *Depo.*, at 39:10-11. As such, he

does not consider, in the least, the vast literature concerning breathing and asphyxia that oppose his thesis.¹

In this case, Kroll makes it clear that he has no opinion on cause of death, other than this assertion that restraint played no role in Tony's death. *Depo.*, at 195:20-196:4. He states he is "'not making any affirmative cause of death opinions," only providing an exclusionary opinion. *Id.*, at 196:5-9. He states this because (or despite) pathologist Dr. Emily Ogden determining that the manner of Tony Timpa's death was a homicide and that the cause of death was the "toxic effects of cocaine and physiologic stress and physical restraint." **Exhibit "D," Death Certificate.** Dr. Ogden further concluded that "[d]ue to his prone position and physical restraint by an officer, an element of mechanical or positional asphyxia cannot be ruled out."² **Exhibit "E," Autopsy.**

Dr. Kroll further expresses no opinions about "the medical treatment" or about "whether the force was appropriate or not."³ *Id.*, 196:22-197:2; 197:7-9. Dr. Kroll acknowledges he did not look at the autopsy photographs. *Depo.*, at 204:16-18. Indeed, he did not think that they were "germane." *Id.*, at 94:12-15; *see also* 101:11-20; 204:21—205:5. Kroll asserts that compression asphyxia does not apply to custodial deaths like Tony Timpa's. He claims that unless there is adequate compression to cause "ribcage failure" and "flail chest" there can be no compression asphyxia. *Depo.*, at 28:17-19. This is necessary, he states, because that a "rigid or expanded rib

¹See, for example, Parkes J. "Sudden death during restraint: do some positions affect lung function?" *Med Sci Law* 2008; 48:137–141; Hussain SN, Rabinovitch B, Macklem PT, Pardy RL. Effects of separate rib cage and abdominal restriction on exercise performance in normal humans. *J Appl Physiol* (1985).Jun;58(6):2020-6; Reay DT, Fligner CL, Stilwell AD, Arnold J. Positional asphyxia during law enforcement transport. *Am J Forensic Med Pathol.* 1992 Jun;13(2):90-7. See also literature published subsequent to Dr. Kroll's deposition. published literature: Steinberg ("Prone restraint cardiac arrest: A comprehensive review of the scientific literature and an explanation of the physiology"- DOI: 10.1177/0025802420988370- Medicine, Science and the Law 0(0)1–12-2021); "Thoracic weighting of restrained subjects during exhaustion recovery causes loss of lung reserve volume in a model of police arrest" by Campbell et al; *Scientific Reports* |(2021) 11:15166 | <https://doi.org/10.1038/s41598-021-94157-w>

² Plaintiffs' three experts pulmonologist Dr. Martin Tobin, cardiologist Dr. Daniel Wohlertner and pathologist Dr. Kim Collins all determined that Timpa died from asphyxia resulting from some 14 minutes of prone restraint.

³ Notwithstanding that statement, Dr. Kroll repeatedly stated his preference for prone restraint, because it allowed officers "increased control" over subjects. *Depo.*, 126:3-19.

cage” facilitates breathing; without it, the rib cage collapses and causes “flail chest, which happens with mechanical asphyxia.” *Depo.*, 28:15-21. “I think that’s the definition of flail chest,” he states, “is sufficient broken ribs so the rib cage has lost its structural integrity...and cannot support negative pressure.” *Depo.*, 68:15-21. Ribcage failure, Kroll insists, has a high threshold. For such ribcage failure to cause flail chest, Dr. Kroll asserts emphatically there must be *at least six fractured* ribs. Timpa did have two rib fractures, though, it is suggested by the medical examiner and others to have occurred as a result of post-mortem cardiopulmonary resuscitation.

Dr. Kroll’s criterion for flail chest, though, is not shared by the Mayo Clinic which specifies only two rib fractures;⁴ other medical authorities, like the Cleveland Clinic, specify three.⁵ In addition, medical authorities universally agree flail chest is “usually due to a severe blunt trauma, such as a serious fall or car accident.”⁶ Where chest flail actually results in asphyxia, it is considered *crush asphyxia*, a “sudden compressive trauma to the thoracoabdominal region.”⁷ As one paper explains,

Crush asphyxia is different from positional asphyxia, as respiratory compromise in the latter is caused by splinting of the chest and/or diaphragm, thus preventing normal chest

⁴ “Flail chest — defined as two or more contiguous rib fractures with two or more breaks per rib — is one of the most serious of these injuries and is often associated with considerable morbidity and mortality. It occurs when a portion of the chest wall is destabilized, usually from severe blunt force trauma. This alters the mechanics of breathing so that the floating segment of chest wall and soft tissue moves paradoxically in the opposite direction from the rest of the rib cage.” <https://www.mayoclinic.org/medical-professionals/trauma/news/flail-chest-an-adult-case-study/mccv20437935#:~:text=Flail%20chest%20%E2%80%94%20defined%20as%20two,from%20severe%20blunt%20force%20trauma..>

⁵ See <https://my.clevelandclinic.org/health/diseases/23994-flail-chest>

⁶ <https://www.urmc.rochester.edu/encyclopedia/content.aspx?contenttypeid=22&contentid=flailchest>. “The risk factors for flail chest are similar to risk factors for major trauma.” <https://my.clevelandclinic.org/health/diseases/23994-flail-chest>. See also *Hill v. Saul*, 2022 WL 975608 at *2 (N.D. Tex. March 30, 2022)(listing left flail chest among injuries in motorcycle collision); *Hutchison v. Apfel*, 2001 WL 336986 at *2 (N.D. Tex. March 9, 2001)(including flail chest among traumatic injuries from oil rig collapse); *Norton v. Astrue*, 2012 WL 642805 at *7 (E.D. La. Jan. 18, 2012)(including rib fractures and chest flail in motor vehicle accident).

⁷ Sertaridou, E., Papaioannou, V., Kouliatsis, G. *et al.* Traumatic asphyxia due to blunt chest trauma: a case report and literature review. *J Med Case Reports* 6, 257 (2012). <https://doi.org/10.1186/1752-1947-6-257>; see also Sedik AM, Elhoushy S. Traumatic asphyxia: A case report and literature review. *Saudi Surg J* [serial online] 2018 [cited 2023 Jan 18];6:63-5. Available from: <https://www.saudisurgj.org/text.asp?2018/6/2/63/233495>

expansion. There are only a few cases or small case series of crush asphyxia in the literature, reporting usually poor outcomes.⁸

Dr. Kroll's generically asserts that because "[m]ost of the published fatal chest compression case involve the mass of a car or tractor (typically > 1000 kg) compressing the torso and hence they set a high upper bound on the mass required for rib cage failure." *Id.*, at 6. In particular, Dr. Kroll relies on instances when soda machines weighing approximately 1,000 pounds fall and crushed subjects who attempted to tip them over. *Rept.*, at 6; *Depo.*; 108:4-14.

From these Coke machine incidents, Dr. Kroll attempted to ascertain what force between 225 pounds and 1,000 pounds would break the sternum and cause ribcage failure. Dr. Kroll employed the 225-pound floor based on the studies conducted by Drs. Theodore Chan and others, which was funded by the County of San Diego during the litigation of *Price v. County of San*, 990 F.Supp. 1230 (S.D. Cal. 1998). In those studies, healthy subjects were placed faced down with 45-pound Olympic weights on their backs.⁹ **For the sake of clarity and brevity, Plaintiffs are filing a separate *Daubert* motion concerning the "Chan studies" as more than one defense expert has relied upon their findings. The present motion addresses opinions that only Dr. Kroll adopts.** For his calculations, Dr. Kroll states he relied on two sources: biomechanical strength of the rib cage and records about judicial pressing.¹⁰ *Depo.* at 45:1-14; 56:11-60:15. Dr. Kroll's source material for his conclusions are the following.

1. a "biomechanical ribcage model predicts that an adult male requires at least 572 ± 57 lbs. of static chest mass to cause flail chest, a potentially lethal condition and a true compression fatality." *Rpt.*, at 7.

⁸ *Id.*

⁹ See, e.g., "Savaser-Chan *et al.*, "The effect of the prone maximal restraint position with and without weight force on cardiac output and other hemodynamic measures." J Forensic Leg Med 2013;20:991," includes a figure of a research subject lying prone with two 45 lb weights placed on his back

¹⁰ Dr. Kroll referenced a third: diving limits. However, it was rejected during the peer review process. *Id.*, at 61:10-62:5. "The final version of the paper just has the biomechanical model and the judicial pressing records." *Id.*, at 62:3-5.

2. Seventeenth and eighteenth records of “judicial pressing” “show that about 600 lb is required to kill.” *Id.*

In creating his model, Dr. Kroll’s report largely ignores the principal anatomical features and systems associated with breathing—*i.e.* the “process of bringing air from the atmosphere into the lungs in order to bring oxygen into the body and flush carbon dioxide out of the body.” **Exhibit “F,” Expert Report of Dr. Martin Tobin.** As Plaintiff’s expert, board-certified pulmonologist Dr. Martin Tobin, explains:

Inspiration is an active process whereby contraction of the diaphragm (a sheet of muscle located between the chest and abdomen) and rib-cage muscles (muscles located between the ribs) causes pressure within the chest cavity to become more negative relative to the outside atmospheric pressure. **The diaphragm is the most important muscle of inspiration** (*Laghi-Tobin-SOA-2003*; *Sant’Ambrogio-1973*) **despite its small mass** (the normal diaphragm weighs 463.7 g (1.022 lb) (*Arora-Rochester-JAP-1982*). Diaphragmatic weight related to body weight according to the formula: $4.18 \times \text{body weight (kg)} - 21.8$ (*Arora-Rochester-JAP-1982*). *Id.*, at 6. (***Emphasis added***).

While the diaphragm is responsible for approximately 70 percent of breathing, the intercostal muscles between the ribs assist in the remaining 30 percent.¹¹ It is the expansion and the contraction of these muscle groups that make breathing possible.

Contraction of muscles of respiration causes expansion of the chest cavity in three directions. Contraction of the diaphragm causes the diaphragm to move downwards (in the direction of the toes) producing an increase of the space of the thoracic cavity for the lungs to expand (*DeTroyer-JAP-2016*). Contraction of the diaphragm and intercostal muscles (muscles connecting one rib to the next rib) causes side-to-side expansion of the chest cavity, so called bucket-handle movement, and also front-to-back expansion of the chest cavity, so called pump-handle movement (*Laghi-Tobin-SOA-2003*).

Dr. Kroll’s understanding of the structure, functions and mechanics of the diaphragm is limited, he concedes. While he could describe the diaphragm as a “dome” or drum-like” structure, (20:15-23), identify some of the diaphragm’s constituent parts and place it at the bottom of the rib cage, he reported surprisingly little else at his deposition. *Depo.*, at 13:10-17. Other than the ribs,

¹¹ Dr. Kroll asserts that the diaphragm and intercostal muscles roles in breathing are “roughly split” in half. *Depo.*, at 53:17-21.

Dr. Kroll does not know what connects to the diaphragm. *Depo.*, at 14:12-13; 15:2-10. “I’m not sure who would. Maybe a surgeon who has to cut it out,” he further wondered. *Depo.*, at 14:13-14. Dr. Kroll, though, asserts the exact anatomical features and its connections, though, are “not really important to my research.” *Depo.*, at 14:10. And while recognizing that diaphragmatic contractions draw air into the chest cavity (inspiration), he concedes he has no understanding of diaphragmatic relaxation, though it is essential to exhaling of carbon dioxide.

Q. What causes [the diaphragm] to return back up so that it can repeat the process to facilitate breathing?

A. I am not sure I can give you an answer on that mechanism.

Q. Okay. Because it does have to go up; right?

A. It does have to rebound, yes.

Q. Rebound. That’s a great word. Because it’s something that happens again and again; is that right?

A. I guess the answer is with the competent rib cage, we have that negative pressure, and that will pull the diaphragm back in.

Q. Is that—do you think that to be the case, or are you just thinking out loud right now?

A. I’m kind of thinking aloud. It’s one of those things that we just take for granted. I’m sure it’s been cited by some physiologist someplace and there’s three papers on it. But I can’t cite all the mechanisms that are involved. There are multiple.

Depo., at 31:25-32:25.¹² While guessing what causes the diaphragm to relax, he likewise gives no thought to effects of such relaxation: namely, the expulsion of carbon dioxide from the lungs. While explicitly conducting no analysis of oxygen gas exchange or diaphragm and costal rib functioning,¹³ Dr. Kroll relied solely on the orthopedic findings concerning ribcage strength. It is the ribcage destruction *only and not* external abdominal pressure that matter to Dr. Kroll with

¹² Dr. Kroll also minimized the role of the diaphragm, urging that “thoracic breathing” can occur “without the diaphragm.” *Depo.*, at 33:2-3.

¹³ See, e.g., Cross CE, Packer BS, Altman M, Gee JB, Murdaugh HV Jr, Robin ED. The determination of total body exchangeable O₂ stores. *J Clin Invest.* 1968;47(10):2402-10.

respect to prone restraint.¹⁴ While expressing acknowledging that seated positions cause the thighs to compress “abdominal mass towards the diaphragm so you have much less freedom for the diaphragm,” he thinks that “if someone is lying prone, we don’t have that pressure,” despite direct resistance from the Earth. *Depo.*, at 129:6-22.¹⁵

A. Kroll relies on “judicial pressing” to conclude there was no compression asphyxia.

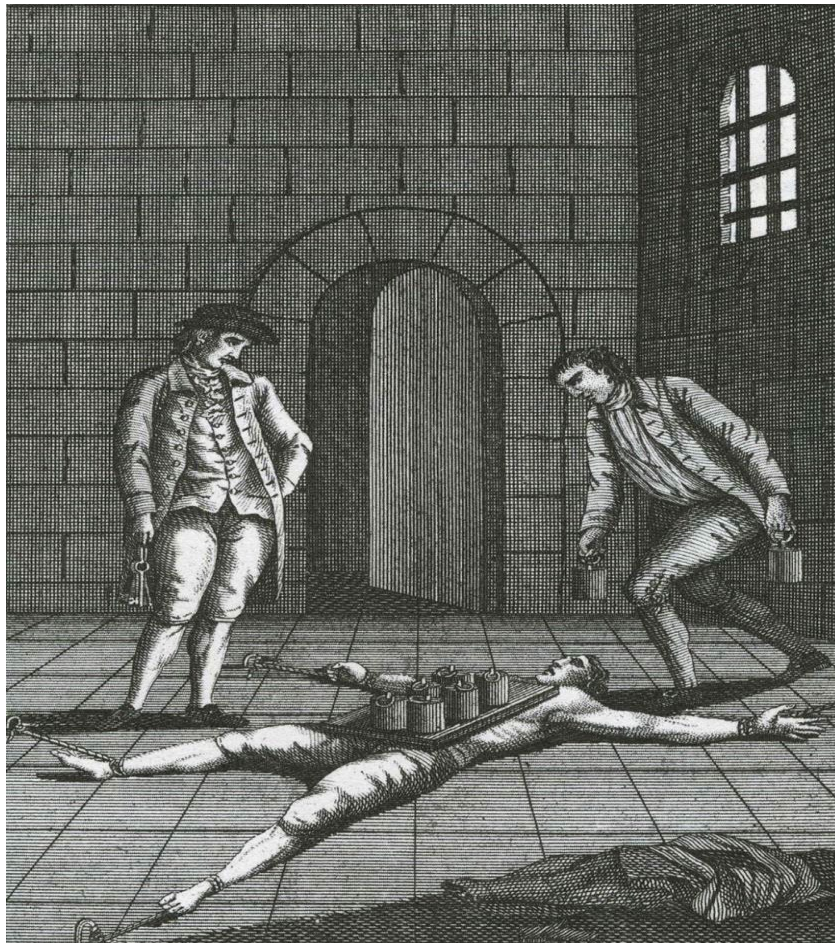
Turning to Kroll’s second claim first—the accounts of judicial pressing—we find that Dr. Kroll does not rely upon any scientific source material or methodology, but a single article published by a Canadian historian, Dr. Andrea McKenzie, for *Law and History Review*. **See Exhibit “G,” Expert report of Andrea McKenzie, PhD.** In her piece entitled “‘This death some strong and stout hearted man doth choose’: The Practice of *Peine Forte et Dure* in Seventeenth- and Eighteenth-Century England”, *Law and History Review* 23, 2 (Summer 2005), 279-313, Dr. McKenzie explains the history of the practice of judicial authorities having weight placed on body parts of subjects compelled to enter a plea of either guilty or not guilty so that proceedings could commence after an arraignment. *Depo.*, at 56:14-57:2. Certain subjects would resist entering such pleas,¹⁶ because a subsequent (often anticipated) determination of guilt would result in not just a death sentence but, in addition, property forfeiture. Dr. McKenzie’s interest in the study was driven by instances, though, where it appeared that indigent subjects resisted entering pleas. As she states

¹⁴Dr. Kroll’s exclusive focus on ribcage failure deviates materially from accepted principles concerning the diaphragm’s primacy in breathing. *See, e.g.*, Sant’ambrogio G, Camporesi E. Contribution of various inspiratory muscles to ventilation and the immediate and distant effect of diaphragmatic paralysis. *Acta Neurobiol Exp (Wars)*. 1973;33(1):401-9; Laghi F, Tobin MJ. State of the Art: Disorders of the respiratory muscles. *Am J Respir Crit Care Med*. 2003;168:10-48.

¹⁵ Paradoxically, he acknowledge that fetal masses during pregnancy and abdominal fat both impair the diaphragm’s functionality. *Depo.*, at 19:2-20:14.

¹⁶ “Incidentally, it may also be pointed out that pressing, or *peine forte et dure*, was never applied for the purposes of “interrogation”, i.e., to extract a confession. It began ostensibly as a sentence of execution for those accused of felonies who “stood mute”, refusing to answer to the charges against them and to take their trial, but seems to have been largely – and, after the seventeenth century, almost exclusively – deployed to induce recalcitrant defendants to enter a plea to their indictments.” *McKenzie*, at 1.

candidly, Dr. McKenzie's interests were to "explore past legal practices" and to "chart changes" and "to speculate about their causes, effects and significance." *Rpt.*, at 3. The procedure of judicial pressing, Dr. McKenzie describes involves the placement of a subject in the supine position with subjects on their backs rather than on the stomach prone. *Id.*, at 3. Weights are then placed on various parts of the body progressively to coerce the subject to plea. *See below*, "Representation of the punishment of peine forte et dure, administered in Newgate prison." From the *Malefactor's Register; or, the Newgate and Tyburn Calendar* (London, 1779), 5 vols., 1:254v (*Eighteenth Century Collections Online*, and Figs. 1-3 of McKenzie's Rept.



The most famous American vestige of the practice came from the pressing of Giles Cory during the Salem Witch Trials.¹⁷ When Dr. McKenzie learned that Dr. Kroll had employed her historical accounts for his conclusions, she concluded that Dr. Kroll's report and opinions are a "misrepresentation or a misreading of my argument as well as the evidence of "the historical records...of judicial pressing". *Id.*, at 1.

Dr. McKenzie takes direct aim at Kroll's assertion that "records of judicial pressing show that about 600 lb is required to kill." *Id.*, at 2. She explains at the outset that "[w]hile the documentary evidence that exists does not always provide precise (or even accurate) information in this respect," Kroll is relying on the account of a single English Catholic martyr, one Margaret Clitherow" who reportedly expired under the pressure of some "seven or eight hundred-weight at the least." *Id.* Dr. McKenzie further states "it it is worth mentioning that officials had clearly been instructed to dispatch [Clitherow] as quickly as possible, also placing a sharp stone under her back to expedite the task." *Id.* "The implication," she states, "is that they immediately applied much more weight than what they deemed would be sufficient to crush her to death, preferring to leave nothing to chance." Dr. McKenzie notes that the only other prisoner killed by pressing that Kroll references from her *peine forte et dure* article was the killing of one "John Weekes, accused of robbery and murder at the Lewes assizes (in Sussex) in 1735."

When Weekes refused to plead, weights were laid on him in hundred-pound increments; and after three hundred, in increments of fifty. At 400 pounds, "he was just dead, having all the Agonies of Death upon him: Then the Executioner, who weighs about 16 or 17 Stone [i.e., between 224 and 238 pounds], lay down upon the Board which was over him, and, adding to the Weight, kill'd him in an Instant." *Id.*

Here, again, Dr. McKenzie notes, that Kroll did not even recount facts accurately.

It seems that Dr Kroll arrived at the figure of "about 600 lb" by adding the 400 pounds and the estimated weight of the executioner. The original account, however, makes it clear that

¹⁷ In *The Crucible*, Arthur Miller familiarly depicts Cory stating, "More weight," when asked if he had any *last words* while he was pressed to death.

Weekes was already expiring under the weight of 400 pounds, and that the executioner deliberately hastened his death to alleviate his suffering. In other words, neither of these examples illustrate that the prisoners in question could have survived being pressed with 400—let alone 600—pounds. *Id.*

As a “scholar in the humanities,” Dr. McKenzie emphasizes that it was “never my purpose to study the physiological effects of the application of *peine forte et dure*, a task I am moreover unqualified to undertake, having no medical training or expertise.” *Id.*, at 3.

Rather, my aim was to explore contemporary legal practices, mentalities and attitudes and chart changes over time and to speculate about their causes, effects and significance. In particular, I wanted to investigate how and why numerous sixteenth-, seventeenth- and eighteenth-century men, and one woman, voluntarily subjected themselves to the horrific ordeal of judicial pressing rather than simply enter a plea and take their trial. *Id.*

She further emphasize that her sources documents are “sources that I consulted (“the historical records”) were anything but rigorous experiments conducted under laboratory conditions, written up by impartial researchers and then subjected to peer review.”

On the contrary, the documentary evidence is often fragmentary and anecdotal, particularly before the emergence, in the late seventeenth century, of the semi-official serial publications the Ordinary of Newgate’s *Account* of the behaviour and confessions of the malefactors executed at Tyburn and the *Proceedings* at the Old Bailey Courthouse.

Such sources, Dr. McKenzie further notes, were “mediated and scripted both by the genre of the publication, the agenda of the author and by the expectations and tastes of the audience.” *Id.*, at 3.

Indeed, she writes, “Some of the sources are explicitly hagiographical (such as that of Margaret Clitherow); many are partisan (penned by officials or others with a vested interest in the case); and most were published with an eye to making a profit and hence may well contain sensationalized elements intended to boost sales.” *Id.* Despite these evidentiary shortcomings, Dr. McKenzie states that it is

worth noting that all of these accounts, as well as the sentence read out in court and the surviving visual representations of this practice, concur in several critical respects: those subjected to the *peine forte et dure* were 1), restrained by having their hands and feet bound

and 2). placed in a supine (*face-up*) position. (Please see Figures 1-3, following this report). *Id.* at 3. (*Emphasis added.*).

There were no autopsies or other determinations of cause of death, either. As a result, Dr. McKenzie concludes, Kroll has no basis to rely on *peine forte et dure* for his conclusions in this litigation.

While I must reiterate that I have no medical expertise on this subject, *it would seem to me that the practice of peine forte et dure would have no application whatsoever to the present instance, in which the individual in question (Tony Timpa) died while being restrained in a prone (face-down) position.* Judging from the contemporary visual representations and written descriptions, those subjected to judicial pressing also had 3). a wooden platform placed over their chests and under the weights, which (by the eighteenth century, certainly) were applied gradually in increments under the supervision of officials. *Id.* (*Emphasis added.*).

Dr. McKenzie so concludes because “contemporary visual representations and written descriptions, those subjected to judicial pressing also had 3). a wooden platform placed over their chests and under the weights, which (by the eighteenth century, certainly) were applied gradually in increments under the supervision of officials.” *Id.*

In his report, Dr. Kroll does not explain any of the details about the two judicial pressings. Where he gave such details, he proved unreliable when asked about body positioning, among other things.

Q. And these subjects, were they supine or prone or both?

A. **They were prone.**

Q. Okay.

A. **I take that back. I think there might’ve been a little of both. I just don’t recall.**

59:19-24.¹⁸ With respect to one person, Dr. Kroll, when asked further, later conceded that he was, indeed, pressed in the supine (face-up) position. *Id.*, at 61:3-5. Making matters worse, though, was that Dr. Kroll did not bring Dr. McKenzie’s report or “any of the materials associated” with his

¹⁸ Q. And regarding the judicial pressing examples, you don’t remember if they were all prone or if they were all supine or both, or what was the deal again on that. A. That correctly surmise—summarizes my answer. I don’t recall. *Depo.*, at 118:15-20.

opinions to his depositions, including any studies or models. *Depo.*, 95:1-6. It was only significantly later that Plaintiff's counsel learned about his misrepresentations of Dr. McKenzie's work.

B. Dr. Kroll asserts compression asphyxia requires six fractured ribs.

The centerpiece of Dr. Kroll's position is mathematical modeling for ribcage failure. He asserts ribcage failure is essential for flail chest and compression asphyxia in arrest-related deaths like Tony Timpa. Dr. Kroll states that he came up with the mathematic results from consulting with Dr. Lanny Griffin at California Polytechnic State University whom he stated derived the number of "575 pounds, plus or minus ten percent" as the weight necessary to break the sternum and fracture six more ribs to cause "flailed chest." *Dep.*, at. 44:24-45:2; 47:10-15; 48:1-19; 49:2-21. He claims that fracturing is essential. He so believes because, he claims—though citing to no authority—the "majority of mechanical asphyxia cases, you have flail chest." *Id.*, 49:17-21; 50:1-13. Despite "flail chest" purportedly being in the *majority* of mechanical asphyxia cases, Dr. Kroll *never* provides an explanation concerning the necessary causation for this phenomenon—only the association or co-incidence with mechanical or compression asphyxia. Dr. Kroll, however, does explain that mechanical asphyxia *without* chest flail in other contexts where law enforcement are not implicated.

A. You can have mechanical asphyxiation in crowd crush situations where it's full body compression without necessarily having broken ribs or flail chest. And a classic, a bunch of people running for an exit—

Q. The Who concern.

A. There you go. Some concert, sure. And they are compressing the chest and the abdomen. And they end up having—they can't breathe. So within a minute, they start panicking. In two minutes, they go unconscious. In four minutes, they're dead. So it's a prolonged full-body compression. They cannot diaphragmatically breathe. They cannot do intercostal breathing. And so they die from true asphyxia.

Concerning the weighted force requirements, Kroll once more relies on the judicial pressing examples. While the model for fracturing six ribs approximated 572 pounds, Dr. Kroll emphasized that it was “also consistent with the judicial pressing where they used a board across the chest to distribute the weight.” *Depo.*, at 118:2-10.

C. Dr. Kroll subsequently publicly disavowed his research.

Following his deposition of December 2019, Kroll’s commentaries on positional asphyxia—unknownst to Plaintiffs—became a subject of interest in the media. In the wake of the killing of George Floyd in particular local media in Minneapolis took particular interest in the opinions of Dr. Kroll, who also resides in the area. However, when Minneapolis broadcaster KARE 11 “repeatedly requested an interview with Dr. Kroll to discuss his findings on prone restraint,” he declined. See <https://www.kare11.com/article/news/local/george-floyd/officers-get-mixed-messages-about-dangers-of-prone-restraint/89-41f41390-d513-4914-8c7e-799702070c82>. Instead, he wrote the broadcaster an email that stated: “*I did some minimal research on this a few years ago and am no longer active in the area.*” *Id.*

ARGUMENT & AUTHORITIES

Federal Rule of Evidence 702 states:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.

FED. R. EVID. 702. The Advisory Committee Notes to Rule 702 emphasize that “the trial court must scrutinize not only the principles and methods used by the expert, but also whether those principles and methods have been properly applied to the facts of the case.”

In construing Rule Dr. of the Federal Rules of Evidence, the United States Supreme Court memorably held in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), that federal courts have a special gate-keeping obligation to “ensure that scientific testimony is not only relevant but reliable.” “The subject of an expert’s testimony,” the Court observed, “must be scientific knowledge,” which “implies a grounding in the methods and procedures of science” and “more than subjective belief or unsupported speculation.”¹⁹ Evaluating the reliability of a prospective expert’s scientific testimony requires an evaluation of “whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.”²⁰

In turn, *Daubert* sets forth a list of factors for courts to consider in assessing the reliability of scientific expert testimony: (1) whether the expert’s theory or technique can be or has been empirically tested; (2) whether the theory or technique has been subjected to peer review and publication; (3) the known or potential rate of error of a particular scientific technique; (4) the existence and maintenance of standards controlling the technique’s operation; and (5) whether the theory or methodology is generally accepted in the relevant scientific community.²¹ The Supreme Court, observing this last factor, provided that a technique which only has minimal support in the relevant community may be viewed with skepticism.²²

¹⁹ *Daubert*, 509 U.S. at 589-90.

²⁰ *Id.* at 592.

²¹ *Id.* at 592-94.

²² *Id.* at 594.

In addition to the original five *Daubert* factors, the Fifth Circuit holds that a trial court may consider additional factors in assessing the scientific reliability of expert testimony. *Black v. Food Lion, Inc.*, 171 F.3d 308, 312 (5th Cir.1999). Such factors may include: (1) whether the expert's opinion is based on incomplete or inaccurate dosage or duration data; (2) whether the expert has identified the specific mechanism by which the drug supposedly causes the alleged disease; (3) whether the expert has unjustifiably extrapolated from an accepted premise to an unfounded conclusion; (4) whether the expert has adequately accounted for alternative explanations; and (5) whether the expert proposes to testify about matters growing directly out of research he or she has conducted independent of the litigation. *See, e.g., id.* at 313; *Moore v. Ashland Chem., Inc.*, 151 F.3d 269, 278–79 (5th Cir.1998); *Christophersen v. Allied-Signal Corp.*, 939 F.2d 1106, 1114 (5th Cir.1991). Scientific testimony is relevant only if the expert's reasoning or methodology can be properly applied to the facts in issue, meaning that there is an appropriate fit between the scientific testimony and the specific facts of the case. *Daubert*, 509 U.S. at 593, 113 S.Ct. 2786. Scientific evidence is irrelevant, however, when there is too great an analytical gap between the data and the opinion proffered. *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146, 118 S.Ct. 512, 139 L.Ed.2d 508 (1997).

When an expert “br[ings] to court little more than his credentials and a subjective opinion,” this is not evidence that would support a judgment. *Viterbo v. Dow Chem. Co.*, 826 F.2d 420, 421–22 (5th Cir.1987). “If an opinion is fundamentally unsupported, then it offers no expert assistance to the jury.” *Id.* at 422; *see also Rosen v. Ciba-Geigy Corp.*, 78 F.3d 316, 319 (7th Cir.) (“[A]n expert who supplies nothing but a bottom line supplies nothing of value to the judicial process.”), *cert. denied*, 519 U.S. 819, 117 S.Ct. 73, 136 L.Ed.2d 33 (1996). The Supreme Court acknowledges that “[t]rained experts commonly extrapolate from existing data,” but that “

‘nothing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert.’” *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 157-58 (1999) (quoting *General Elec. Co. v. Joiner*, 522 U.S. 136, 146, 157 (1997)). When deciding whether to admit expert testimony, “[a] court may conclude that there is simply too great an analytical gap between the data and the opinion proffered.” *Id.*

A. The Court must exclude Dr. Kroll’s methodology based on judicial pressing.

“A party seeking to introduce expert testimony must show” among other things that the testimony is based upon sufficient facts or data.” *Carlson v. Bioremedi Therapeutic Systems, Inc.*, 822 F.3d 194, 199 (5th Cir. 2016) citing *Smith v. Goodyear Tire & Rubber Co.*, 495 F.3d 224, 227 (5th Cir.2007) (quoting FED.R.EVID. 702).

Dr. Kroll’s reliance on the accounts of judicial pressing fails the sufficient data and “good science” prong of *Daubert* at the outset. *The* historian whose works upon which Kroll relies make it plain his reliance is bad science. 113 S. Ct. at 2795, 2797. As Dr. McKenzie unambiguously states, there is nothing scientific about the historical accounts of judicial pressing. The source documents from the Old Bailey and elsewhere were often fragmented and “partisan,” “hagiographic,” and “sensationalist” accounts for the purpose of sales. The examples, she emphasizes, “were anything but rigorous experiments conducted under laboratory conditions, written up by impartial researchers and then subjected to peer review.” Having no empirical testing, ascertainable rates of error, much less peer review, his work is fatally flawed. *Daubert, supra*. Indeed, Dr. McKenzie and Dr. Kroll are not professional peers. Her relevant peers are other *historians*.

The additional *Daubert* factors Kroll's dubious opinions even more suspect. Dr. Kroll provides no operative "duration data" concerning the supine pressing. *Black.*, 171 F.3d at 312; *Moore*, 151 F.3d at 278–79; *Christophersen*, 939 F.2d at 1114. As neither of the *peine forte* subjects were prone (much less handcuffed from behind with a knee in their back), Kroll simply cannot. Again, these were not laboratory accounts, but chronicles peddled or propagated outside the Old Bailey for either profit or partisan purposes. Furthermore, Dr. Kroll has "has unjustifiably extrapolated from an accepted premise to an unfounded conclusion." *Id.*

His premise both from the soda machines and with the judicial pressing is this: falling 1,000-pound soda machines and judicially pressing subjects with 600 lbs. kills. Though, there is no proof cited from the judicial pressing, each mechanism must cause also flail chest. The analytical gap here is vast, though. *Kumho Tire*, 522 U.S. at 157. We have no evidence that that the supine subjects even suffered flail chest as there was no autopsy evidence. Indeed, Kroll makes no mention that Margaret Clitherow had a sharp stone lodged in her back and thus could have been impaled or suffered blunt trauma. His extrapolations to his specific weight requirements *for death*, which could have occurred by means other than his flail chest thesis, are thus material leaps in logic. *Id.* Besides failing to bridge the analytical gap *Kumho Tires*, Kroll's speculative framework falls far shorter of the rigor employed in other pulmonary studies. The Fifth Circuit has rejected far more rigorous attempts at establishing pulmonary failures. *See, e.g., Johnson v. Arkema*, 658 F.3d 452, 465 (5th Cir. 2012)(rejecting pulmonary lab tests with documented hourly dosages where lung tissue resulting tissue damage not adequately linked MBTC toxicity).

Like most of his work, Dr. Kroll's work is the product of litigation—both the instant case and others like it. His interest began first to exonerate TASER and has continued thereafter in the service of law enforcement in asphyxia cases. His particular regarding flail chest, he states

explicitly, is simply to defend litigation claims against the police. He candidly states he has no other purpose than to deflect liability claims. Such litigation-based scholarship is inherently suspect under *Daubert*. *Sheehan v. Daily Racing Form, Inc.*, 104 F.3d 940, 942 (7th Cir.1997). Inexplicably, when given a chance to defend his dubious work in the wake of the George Floyd restraint-asphyxia homicide, Kroll disavows it.

Given his initial trajectory and severely flawed methods, little surprise is that Kroll gives no account “for alternative methods.” *Black*, 171 F.3d at 313; *Moore*, 151 F.3d at 278–79; *Christophersen*, 939 F.2d at 1114. While the assistant medical examiner perspicuously states she cannot rule out restraint asphyxia, Kroll can, despite no reliance on autopsy photos; diaphragm operation; bodycam video; or Timpa’s body mass. He conducts no analysis about resulting effects or changes on carbon dioxide-oxygen change. Nor, for example, does he consider diaphragmatic or intercostal muscle effectiveness. Dr. Kroll asserts that only orthopedic ribcage failure causes material respiratory and ventilation changes. Like an engineer believing that a building’s air conditioning failure can only occur if framing collapses, he gives no accounts to alternative explanations to air flow.

Even worse, in the two examples he chooses,²³ Dr. Kroll misapplies his entire analysis of *peine forte*. His indiscriminate reliance and inaccurate recounting of material facts, indeed, raise suggest his reliance erroneous is not merely erroneous, but entirely disingenuous. Kroll makes no mention that authorities lodged a sharp stone in the back of martyr Margaret Clitherow to kill her rapidly. *Daubert* requires not just a sound methodology, but equally sound application. *Nikolova v. University of Texas at Austin*, 585 F.Supp.3d 936, 941 (W.D. Tex. 2022). As the sharp stone fact makes clear, Kroll employs neither. Making matters still worse, Dr. Kroll miscalculates

²³ Dr. Kroll, however, did not recall the number of instances from the study he chose. *Depo.*, at 58:3-5.

the weight employed in the John Weekes' case by some 200 pounds. Whether negligently or intentionally made, this miscalculation was made in the service of his 600 lb., six-rib flail chest thesis. Given the glaring flaws in this small sampling, it is equally unsurprising that Dr. Kroll makes no suggestion about any "known or potential rate of error of a particular scientific technique." *Id.* Once more, Kroll's methodology fails another *Daubert* factor.

No less important, the accounts and illustrations Dr. McKenzie all show subjects face-up. As indicated, Dr. Kroll began with bad science and made it worse. As a result, Dr. McKenzie herself expressly states that Kroll misrepresented or mischaracterized her work. Some subjects have weights disbursed throughout their bodies; some have boards placed upon weights. Throughout his deposition, Dr. Kroll could not even recall whether the two subjects he identified were face-up or face-down. It is not insignificant either that *both* subjects were, indeed, face-up. No less problematic was Dr. Kroll's continued suggestions that somehow the judicial authorities were reliable scribes systematically recording various weights and measures to determine the precise forces employed. Dr. McKenzie makes it clear that such accounts were anything but reliable science. As hagiographic works of partisans and profiteers, they were more like sensationalist playbills than recordings in rigorous science journals. In sum, Dr. Kroll is neither a reliable historian of the operative facts, much less a reliable scientist of the record.

What cannot be forgotten, too, is that Dr. Kroll employed these two examples to support his six-ribbed, flail chest thesis. There is no evidence here that any of these individuals had flail chest, as there was no autopsy or other study of cadavers. Indeed, Margaret Clitherow had a sharp stone lodged in her back and as Dr. Kroll, each had a board on his or her chest that distributed the weight. Neither of the subjects are handcuffed, ziptied, face down with a knee in their back. Dr.

McKenzie thus emphasizes that her scholarly research on judicial pressing “has no application to the present case.”

B. The Court must exclude the “flail chest” methodology

Daubert requires that an opinion must rest on sound methodology and be reliable in theory, but also that it “logically advances a material aspect of the proposing party’s case.” 113 S.Ct. at 2796. It must also be *relevant* under Federal Rule 702 and must “fit,” the facts, the Supreme Court insists. It must “help the trier of fact to understand the evidence,” not confuse it. FED. R. EVID. 702(a). Dr. Kroll’s reliance on the weights and forces required to cause ribcage failure is misleading. As reliable medical authorities universally report, flail chest is the result of blunt trauma. Thus, Dr. Kroll’s entire model is predicated on an inapposite definition of his own creation. Flail chest is the result of sudden, crush injuries. Flail chest involves rib fractures—not diaphragmatic compromise. 113 S.Ct. at 2796. Even worse, Dr. Kroll deviates from accepted definitions of flail chest, *increasing* the required rib fractures by two to three-fold from traditional medical authorities, like the Mayo Clinic and the Cleveland Clinic. While it may or may not be true that 575 lbs. of force is necessary to break the six ribs he insists is necessary for *crush asphyxia*, he does not provide any reliable evidence concerning the forces necessary to cause *compression asphyxia*. Instead, he inappropriately asserts that the two subjects identified in Dr. McKenzie’s *peine forte* article somehow corroborates the notion that 600 lbs. is, indeed, the threshold weight for death. Again, no mention, again, was made of any of the following:

- the placement of the stone in one subject’s back;
- his miscalculation of the weight in one instance;
- the supine position of the subjects; or

- any mathematical accounting of the disbursal of force caused by the size dimensions of the weights or the use of a flat board laid across the supine subject.

Even assuming *arguendo* that Dr. Kroll had immaculate metrics concerning the force required to crush a sternum, fracture six or more ribs and cause flail chest, it is irrelevant here. Plaintiffs have not asserted that Defendants caused *crush asphyxia*—some massive, sudden blunt force trauma—but *prolonged* restriction of Tony Timpa’s respiratory system. What Kroll has done here is recite findings that some 575 lbs. of force will fracture six ribs. However, he has not shown in the least how that that finding is *relevant*, given that he has conducted no analysis of the diaphragmatic and intercostal muscles controlling breathing. Again, even if Dr. Kroll had actually not relied on the ordeals of just two subjects judicially pressed on their backs during the Renaissance Era, Dr. Kroll’s thesis fails. While there is no indication that either of the two pressed subjects even had flail chest, that is beside the point. Dr. Kroll only demonstrates that these two individuals died *some way* during their pressings. What bears emphasizing, too, is that Kroll expressly acknowledges circumstances where compression asphyxia occurs without the fracturing of some six ribs and attendant ribcage failure. In this instance, *Daubert* bars the admission Dr. Kroll’s thesis, because it is simply irrelevant. *Daubert* requires that evidence be a “good fit”; Dr. Kroll’s simply do not qualify.

Another *Daubert* hurdle Kroll stumbles upon is his failure to “adequately account for obvious alternative explanations.” *Michaels v. Avitech, Inc.*, 202 F.3d 746, 753 (5th Cir. 2000), *U.S. v. Eff*, 461 F.Supp.2d 529, 534 (W.D. Tex. 2006). In the present case, Dr. Kroll makes it clear that his only objective is to rule out police restraint as the cause, unlike the pathologist who performed Timpa’s autopsy. In service of this thesis, Kroll ignores autopsy photos and videotaped footage of 14 minutes of prone restraint. Plaintiffs, here, do not rely on papers written by

cardiologists, pulmonologists, pathologists or emergency physicians supporting compression asphyxia. Dr. Kroll further provides no explanation about the effects of the restraint on diaphragmatic breathing and related effects—particularly when the diaphragm relaxes when carbon dioxide gets blown off. Concerning such germane matters he can only “guess” or “think aloud.” Instead, he relies upon an artificially created orthopedic model revolving around the crush strength of the ribcage. His subsequent disavowal of his own work following George Floyd’s death further elucidates that his thesis inadequately accounted for alternative explanations, since like Timpa, Floyd had did not suffer six broken ribs.

CONCLUSION

Dr. Kroll takes inappropriate liberty with Renaissance history and modern medicine. His reliance on *peine forte* is poor science *ab initio*. Dr. Kroll makes his judicial pressing cases worse, though, by relying on biased accounts, miscalculating weights and subjects that were not even prone. In no instance either does he provide the proof of an actual mechanism of death. His idiosyncratic ribcage failure model likewise fails. It is plainly irrelevant because it addresses sudden crush *asphyxia* not *compression* or *positional asphyxia* caused by intercostal muscle and diaphragmatic restriction. Indeed, he all but ignores the diaphragm’s essential role to breathing. Still further, he makes matters worse by employing a restrictive definition of “flail chest” that is not accepted by the medical community. He has not engaged in scientific inquiry here but has misapplied judicial records to manufacture an irrelevant force standard. *Daubert* and FRE 702 require excluding his opinions, which are neither reliable nor relevant.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on January 20, 2023, I electronically submitted the foregoing document with the clerk of the court for the U. S. District Court, Northern District of Texas, using the CM/EFC system which will send notification to all attorneys of record who are registered for electronic notice.

s/ Geoff J. Henley
Geoff J. Henley